

Enemy Territory Master Server Behavior

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Outline



- Motivation
- Experiment Details
- Validating Results
- Current Results
- Conclusion & Future Work

Motivation



- Previous analysis [1],[2]
- Player's frustration when finding local servers
- Enemy Territory's server discovery process investigated.

[1] C.Javier,S.Zander, G.Armitage, 'Round Trip Times & Hop Distributions for Clients of an Enemy Territory Server Based in Australia, December CAIA TR, 2005.

[1] S.Zander, D.Kennedy, G.Armitage, 'Dissecting Server-Discovery Traffic Patterns Generated By Multiplayer First Person Shooter Games', ACM Net Games 2005, NY, USA, 10-11 October

Experiment Details



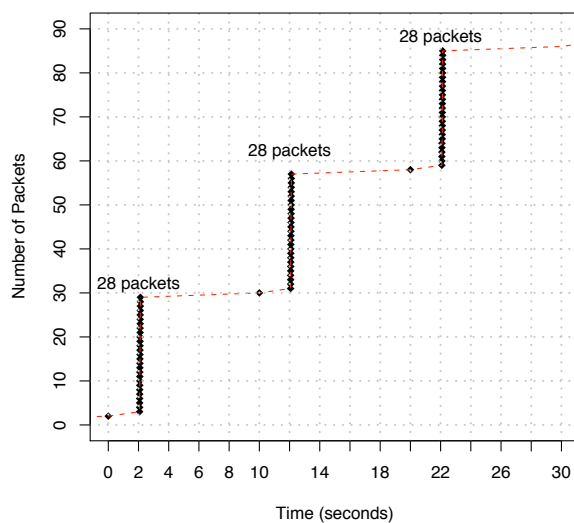
- Polled Enemy Territory Master Server for 3 weeks
- Every 30 minutes received list of game servers
- Every 6 hours probe game server list obtained using Qstat & probe sequence from previous work
- Tried to find patterns in the server list

Fluctuating Network Conditions



- Poll master server 3 times in a row, 10 seconds apart
- Use largest list of game server IPs
- 26 - 28 UDP packets received on average

Method validation

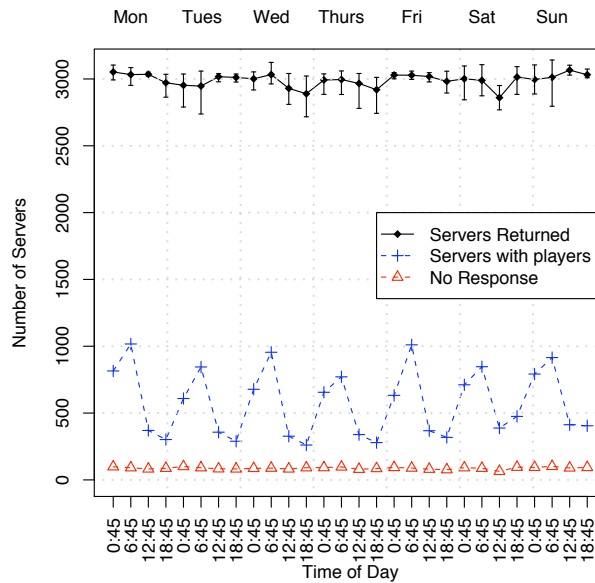


No. of Polls with largest set of IPs	% largest set of IPs
3 Polls	59%
2 Poll	21%
1 Poll	20%

Weekly Pattern



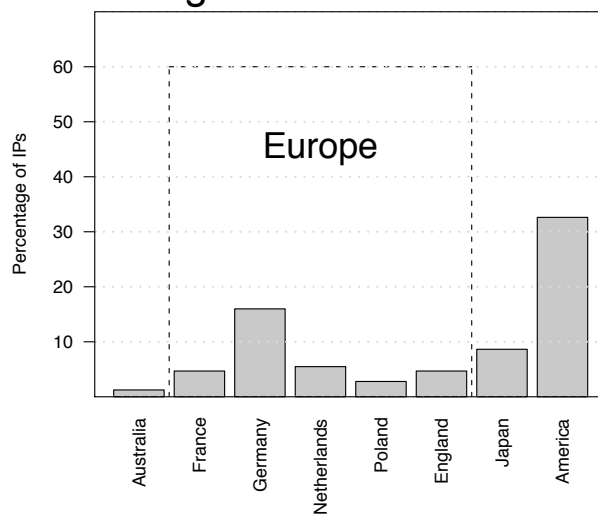
- ~3000 Server IP addresses returned
- Peak Number of Players at Night time



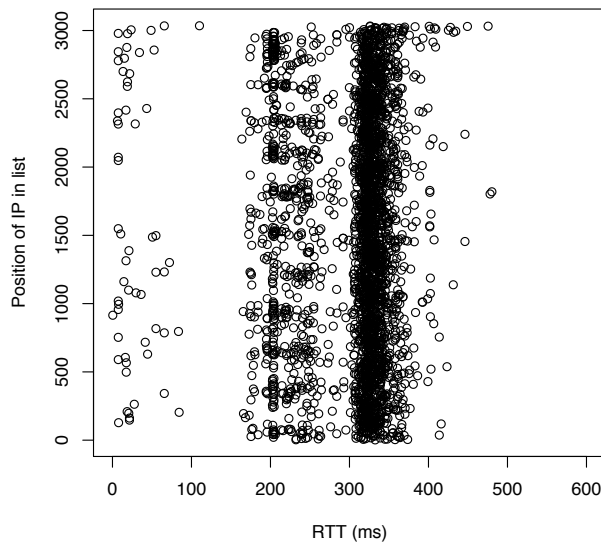
Geographical Distribution of Servers



- 6751 individual servers identified
- 60% of ET game servers from Europe

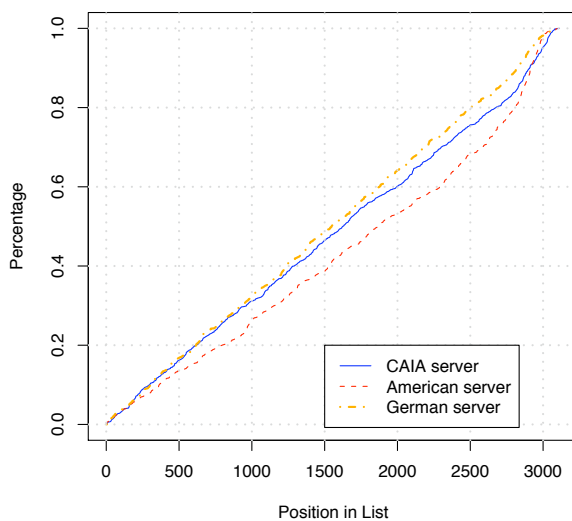


RTT relation with Position in List



- Three distinct regions
- No relation

CAIA Server position in Server list

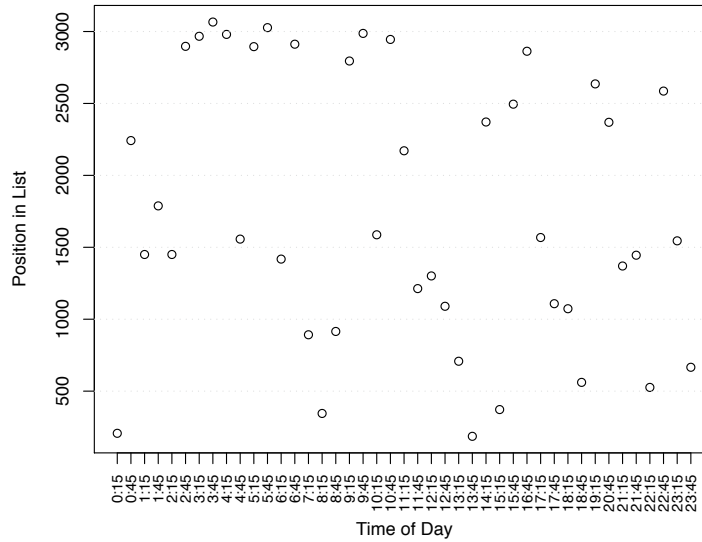


Server(rank)	Mean	Min	Max	StDev
CAIA(941)	1623	1	3113	944
America (1)	1780	1	3097	943
German (2)	1556	4	3095	905
Optus (510)	1900	4	3107	994
Telstra (421)	1768	8	3095	957

CAIA Server - Daily Positions



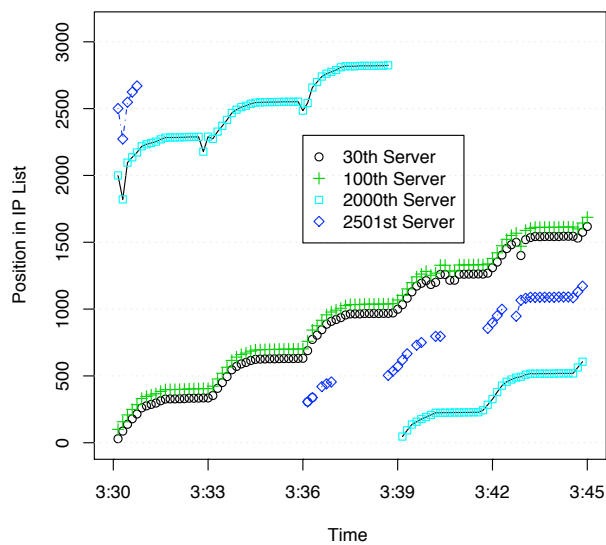
- Seems random



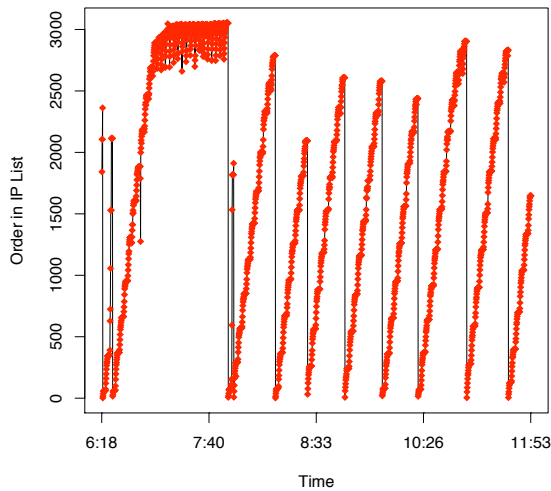
Increase Sample Rate



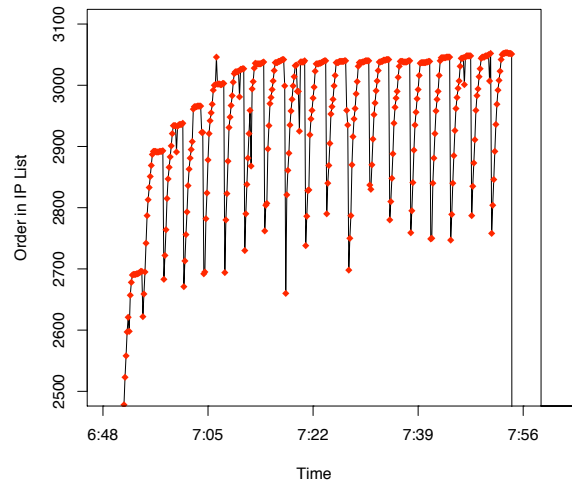
- Pattern found with increased sample rate



CAIA server's position



Zoomed out



Zoomed in

Conclusion



- Enemy Territory game servers come from Europe & America thus the large amount of probing from these countries.
- Australia has a tiny portion of servers
- More players are in game servers at night time
- Game server list does have a pattern and servers are rotated positions and given a chance to be in every position by the master server
- Game server list is randomized depending on sample rate

Future Work and Suggestions



- Write an algorithm to predict where servers could be on the server list
- Further Investigate if I can find relation between master server communications with game servers
- Implement a proxy master server to send Australian game servers only (eg. Half Life) to game clients
- Conduct vigorous Enemy Territory testing

Thank you



- Any questions?